

**WHAT IS CLAIMED IS:**

1. An NMR probe, comprising:  
a permanent magnet generating a homogenous magnetic field ( $B_0$ );  
and a pair of RF gradient coils enclosing said permanent magnet for receiving RF current to generate a gradient magnetic field ( $B_1$ ) perpendicular to said homogenous magnetic field ( $B_0$ );  
said pair of RF coils being orthogonally located with respect to each other such that the gradient magnetic field ( $B_1$ ) is rotatable about the longitudinal axis of the probe according to the current through one RF coil relative to that through the other RF coil.
2. The probe according to Claim 1, wherein said RF coils are located along the outer surface of said permanent magnet orthogonal to each other and have longitudinal axes parallel to the longitudinal axis of said probe.
3. The probe according to Claim 1, wherein said permanent magnet and said pair of RF coils are sized and configured for introduction into a lumen of a person's body.
4. The probe according to Claim 3, wherein said permanent magnet is of a dome-shaped configuration at its opposite ends to facilitate the introduction of the probe into said lumen.
5. The probe according to Claim 1, wherein said probe further comprises an RF current supply having means for varying the RF current supplied to each of said RF coils.
6. The probe according to Claim 1, wherein said permanent magnet is of a solid cylindrical configuration and generates a diamctrical magnetic field  $B_0$ .

7. The probe according to Claim 1, wherein said permanent magnet is of a hollow cylindrical configuration and generates a diametrical magnetic field  $B_0$ .
8. The probe according to Claim 1, wherein said permanent magnet is of a solid cylindrical configuration and generates an axial magnetic field  $B_0$ .
9. The probe according to Claim 1, wherein said permanent magnet is of a hollow cylindrical configuration and generates an axial magnetic field  $B_0$ .
10. The probe according to Claim 1, wherein said permanent magnet is of a solid cylindrical configuration and generates a radial magnetic field  $B_0$ .
11. The probe according to Claim 1, wherein said permanent magnet is of a hollow cylindrical configuration and generates a radial magnetic field  $B_0$ .
12. The probe according to Claim 1, wherein said permanent magnet is of a permanent magnetic material for the complete length of the probe.
13. The probe according to Claim 1, wherein said permanent magnet includes an end section of a permanent magnetic material at each of the opposite ends of the probe, and an intermediate section of an unsaturated, high-permeability material between said end sections.
14. An NMR probe, comprising:
  - a permanent magnet generating a homogenous magnetic field ( $B_0$ );
  - and a pair of RF gradient coils located on the outer surface of said permanent magnet for receiving RF current to generate a gradient magnetic field ( $B_1$ ) perpendicular to said static magnetic gradient field ( $B_0$ );
  - said pair of RF coils being orthogonally located with respect to each other and have longitudinal axes parallel to the longitudinal axis of said probe, such that the

gradient magnetic field ( $B_1$ ) is rotatable about the longitudinal axis of the probe according to the current through one RF coil relative to that through the other RF coil.

15. The probe according to Claim 14, wherein said permanent magnet and said pair of RF coils are sized and configured for introduction into a lumen of a person's body.

16. The probe according to Claim 14, wherein said permanent magnet is of a dome-shaped configuration at its opposite ends to facilitate the introduction of the probe into said lumen.

17. The probe according to Claim 14, wherein said permanent magnet is of a permanent magnetic material for the complete length of the probe.

18. The probe according to Claim 14, wherein said permanent magnet includes an end section of a permanent magnetic material at each of the opposite ends of the probe, and an intermediate section of an unsaturated, high-permeability material between said end sections.

19. An NMR probe, comprising:

a permanent magnet generating a homogenous magnetic field ( $B_0$ );

and a pair of RF gradient coils located on the outer surface of said permanent magnet for receiving RF current to generate a gradient magnetic field ( $B_1$ ) perpendicular to said static magnetic gradient field ( $B_0$ );

said pair of RF coils being orthogonally located with respect to each other and have longitudinal axes parallel to the longitudinal axis of said probe, such that the gradient magnetic field ( $B_1$ ) is rotatable about the longitudinal axis of the probe according to the current through one RF coil relative to that through the other RF coil;

said permanent magnet and said pair of RF coils being sized and configured for introduction into a lumen of a person's body.

20. A catheter for introduction into a lumen of a person's body comprising: a bifurcated sleeve having one bifurcation receiving the probe defined in Claim 19, and another bifurcation for receiving a guidewire for guiding the probe to a desired location within said lumen.